



NASA photo

STS-88 crew inspects Unity, built by Boeing at the Marshall Center

Built by the Boeing Company at Marshall, Unity —the connecting node of the International Space Station — is examined recently by STS-88 crew members at the Space Station Processing Facility at Kennedy Space Center, Fla. Unity, the first U.S. Space Station element, is scheduled for launch aboard Space Shuttle Endeavour at 2:59 a.m. Dec. 3 from Pad 39-A at Kennedy.

Marshall exceeds Center's CFC goal

Marshall Center federal government employees, retirees and on-site contractors contributed \$441,224 to charitable organizations through the 1998 Combined Federal Campaign (CFC) — surpassing this year's Center goal.

"The entire CFC executive committee is very proud to report that Marshall has once again not only achieved its financial goal, but exceeded it," said Cathy Nicholson, 1998 CFC chairwoman.

See CFC on page 5

"Safety, thanks to you it's working"

Safety slogan submitted by Zena Hester, EJ71

Students, Center engineers test student-developed telescope

by Tracy McMahan
Media Relations Office

More than a decade of effort by over 200 students from Brigham Young University in Provo, Utah, culminated this summer as students worked with engineers at the Marshall Center to prove their solar telescope worked. Through Marshall's Technology Transfer Office, a Space Act Agreement was signed by NASA and Brigham Young University.

The telescope is called "GoldHelox" — a name that comes from the Sun's golden color and its ability to make "heliocentric" observations in X-rays. It is designed to be flown aboard a future Space Shuttle mission. Aboard the Shuttle, the telescope can detect solar X-rays obscured by Earth's atmosphere.

"Once in orbit aboard the Space Shuttle, GoldHelox will take 250-300 images of the Sun," said Jonathan Barnes, a senior physics major at Brigham Young who worked on the telescope's optics. "It will provide a real-time movie of solar activity."

See GoldHelox on page 4

Microwave ovens: Friends or foes

by Dennis Davis
Safety & Mission Assurance Office

Microwave ovens offer a fast, convenient method for heating and cooking food. When was the last time you strolled to the office breakroom, snagged your lunch from the fridge, popped it in the microwave, turned it on, then headed back to your office to work while your food was cooking? Sound familiar?

Four microwave oven fires on Center within the last three months have been caused by burning popcorn, according to the Marshall Industrial Safety Office. In each incident, a building was evacuated when smoke from the fire activated the automatic fire-detection system. Fortunately, none of these fires spread beyond the ovens.

The Safety Office offers the following safety tips for microwave oven usage:

- Never leave a microwave oven unattended while cooking.
- Use short cooking time-cycles when using a microwave oven for the first time for a specific food item. Power capabilities may differ significantly between microwave ovens. A power setting normally used to cook food in one microwave unit may burn the same food item in another unit.
- If the microwave unit has designated keys/buttons for

See Microwave ovens on page 5

Marshall tests flight telemetry system for X-33 launch vehicle

by Mike Wright

Internal Relations & Communications Office

The Marshall Center has finished testing the flight command and telemetry communications system for the X-33 launch vehicle, NASA's flagship technology demonstrator.

The wedge-shaped X-33 is a sub-scale technology demonstration prototype of a Reusable Launch Vehicle. It is being developed under a cooperative agreement between NASA and Lockheed Martin Skunk Works at Palmdale, Calif. The X-33 is a major assignment of the Space Transportation Programs Office at Marshall.

The command and telemetry system tests were among a series of X-33 tests conducted this year by Marshall's Astrionics Laboratory.

"We have been providing general support, consultation and analysis on the overall X-33 communications system to AlliedSignal in Baltimore, Md., the industry partner selected to develop the communications subsystem for the vehicle," said Paul Kennedy, team lead for the Radio Frequency Design and Analysis Team in the Astrionics Laboratory.

"We have supported them in a number of areas, and we recently tested the complete command and telemetry system for the X-33 in the Astrionics Lab," Kennedy said.

Initially, the work at Marshall included system design analysis and support during preliminary and critical design reviews. Kennedy and others also studied and contributed to development of required system specifications and description documentation.

"The flight command and telemetry system is comprised of a



NASA photo by Emmett Given

Paul Kennedy, an engineer in the Telemetry Systems Branch in Marshall's Astrionics Laboratory, prepares for a test of the X-33 command and telemetry subsystem.

set of transmitters, receivers, bit synchronizers and other signal combining components," Kennedy said. "After each component was individually acceptance-tested at the vendor facilities, it was shipped to AlliedSignal and assembled into an integrated subsystem," he said.

Next, Marshall's Astrionics Laboratory tested the complete command and telemetry subsystem. "We conducted tests on the assembled subsystem as well as additional tests on some of the individual components," Kennedy said. "AlliedSignal had developed a communications test set at their facility, but we had some additional test capabilities they didn't have. So, they decided to bring all of the flight hardware, along with their test set, to our lab, where we essentially completed a system acceptance test. This meant all of the boxes had to work together as an integrated assembly," he said.

AlliedSignal shipped two complete subsystems to Marshall. One subsystem will go on the X-33 vehicle. "Another will go to the Dryden Flight Research Center's Integration and Test Facility at Edwards Air Force Base, Calif., and then be flown on a high-altitude research aircraft that Dryden has," Kennedy said.

The X-33 will demonstrate key technologies and operational aspects of a single-stage Reusable Launch Vehicle rocket system to reduce the risk to the private sector in developing a commercially viable system.

Through demonstration flights and ground research, the X-33 program will provide the information needed for industry representatives, such as Lockheed Martin, to decide whether to proceed with the development of a full-scale Reusable Launch Vehicle Program.

The X-33 will take off vertically like a rocket, reaching an altitude of up to 60 miles and speeds between Mach 13 and 15, or 13-15 times the speed of sound. It will land horizontally like an airplane. As many as 15 tests of the X-33 are planned to originate from Edwards beginning in 1999.

Henderson named deputy for management of Microgravity Research Program Office



Robin Henderson

Robin Henderson, deputy director of Marshall's Microgravity Research Program Office, has been appointed deputy for management of the office by Center Director Art Stephenson.

Henderson has served as assistant to the manager of the Space Systems Projects Office at Marshall and worked in various roles within that organization,

including business manager of the Upper Stage Projects Office; business manager of the Microgravity Projects Office; and deputy manager of the Microgravity Projects Office.

She joined the Marshall Center in 1983 in the Program Planning and Control Office of the Hubble Space Telescope Office. In the mid-1980s, Henderson accepted a one-year assignment in the Space Station Program Office at NASA Headquarters in Washington, D.C.

Henderson has received numerous NASA awards, including the Exceptional Achievement Medal.

It's all about going to the stars

Space Sciences Laboratory Report

In a significant advance in fabrication of large bulk ceramic superconductors, Marshall researchers have successfully fabricated a large disk of the high-temperature, superconducting material yttrium barium copper oxide (YBCO).

The 10-pound, 12-inch diameter disk was fabricated as part of the Delta-G

Experiment to investigate a suspected gravity modification effect reported in scientific literature in 1992. In that experiment, researchers at Tampere University in Finland were investigating electromagnetic properties of this high-temperature superconductor when they claimed that objects located above the disk lost weight when the disk was operated in a certain way.

"The weight loss wasn't much, 2 percent at most," said Ron Koczor, Delta-G experiment manager. "But, if real, it represents the first laboratory-scale experimental evidence of a coupling between electromagnetic fields and gravity anywhere near this magnitude. That's our interest in it."

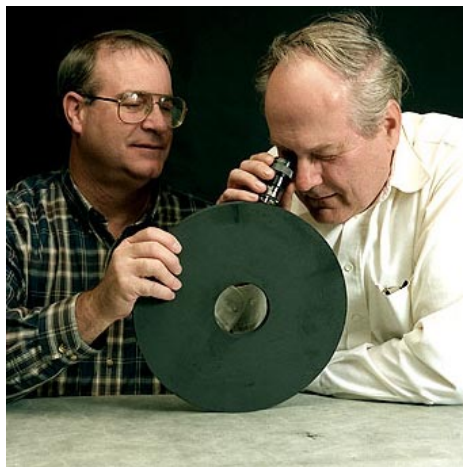
The Marshall Delta-G Experiment consists of a series of investigations into the properties of YBCO, leading to an attempt to duplicate the Tampere experiment. "Fabricating a solid superconducting disk this size had never been done in the United States before Delta-G began," said David Noever, the experiment scientist.

"This material has a long connection to Marshall and the University of Alabama at Huntsville," said Noever. "The material's superconducting properties were discovered at the University of Alabama in Huntsville in 1987. Researchers from

Marshall's Space Sciences Laboratory worked with the university to discover some of the most basic characteristics of this and other high-temperature ceramic superconductors. These high-temperature ceramic superconductors do not act like metal superconductors. They have some unique and interesting properties."

The Tampere experiment requires a large composite YBCO disk to rotate at up

to 5,000 rpm while being levitated magnetically, rotated inductively, and excited with high frequency radio waves. At the same time, the disk must be in a superconducting state, which happens at and below 93 Kelvin. A further requirement is that the disk consist of two layers, one of superconducting YBCO and a thinner layer of normal YBCO.



NASA photo by Adeline Byford

Bob Hiser of Martin Technologies Inc., left, and Ron Koczor of Marshall's Space Sciences Laboratory, inspect the first yttrium barium copper oxide superconductor disk fabricated at the Marshall Center.

"The real challenge will be to design an experiment that allows all of the required conditions to exist simultaneously," said Tony Robertson, Delta-G experiment engineer. "The details available about the Tampere device are very sketchy."

Once the two-layer disk is fabricated and its mechanical and superconducting characteristics determined, the focus of the Delta-G team will shift from disk fabrication to designing and building a reasonable facsimile of the Tampere device. The team has already established an accurate and repeatable method of measuring changes in gravity. Using a commercial gravimeter, the team can measure gravity changes on the order of several billionths of 1G with a stability that allows tracking the daily tidal changes of the Sun and Moon.

Funding for the Delta-G Experiment was made available through the Marshall Center Director's Discretionary Funds and

Bldg. 4201 verified clean after precautionary closure

Marshall Center employees assigned to Bldg. 4201 were allowed to return to the building Tuesday morning following emergency response precautions implemented Monday to deal with an asbestos-related incident in the basement of the building.

After extensive testing, NASA determined that no building occupants were exposed to "in air" asbestos. Asbestos monitoring was conducted on Monday, and again early Tuesday. All samples met NASA's stringent requirements which are 10 times stricter than Occupational Safety and Health Administration (OSHA) requirements.

Employees assigned to the building were granted administrative leave at 9:30 a.m. on Monday. "The first and foremost thing in our minds was your safety," Sheila Cloud, director of the Center Operations Directorate, told returning employees Tuesday morning.

Cloud, along with Dr. Rebecca McCaleb, director of the Marshall Center's Environmental Engineering and Management Office, and other members of the team responsible for implementing the emergency response procedures, met with the employees in Morris Auditorium to explain the details related to the incident and the precautions that were implemented. Cloud said details of the corrective actions and information concerning asbestos would be provided to Marshall employees and contractors, and also posted on Inside Marshall.

the Space Transportation Research Program within the Advanced Space Transportation Program at Marshall. John Cole, manager of the Space Transportation Research Program, said this is one of the "farthest-out-of-the-box" concepts his program is studying. "I don't know if this effect is real. But if it is, the payoff would be tremendous," said Cole. "Being able to manipulate gravity would clearly revolutionize space transportation."

"Credible research toward incredible physics — that's what someone called these attempts to develop breakthroughs in space transportation physics," said Koczor. "We all know that chemical rockets aren't going to take us to the stars. So we have to start somewhere looking for their replacement. That's what Delta-G is all about."

GoldHelox

Continued from page 1

In 1988, another Brigham Young physics student, James Maxwell, had an idea for a research paper, and the project was born. Maxwell now has a doctorate in mechanical engineering. Since GoldHelox's inception, many of the undergraduate students on the original team have earned advanced degrees. Many have gone on to work in the space industry — and some have become NASA scientists and engineers. The broad range of talent on the team has included students majoring in physics, mechanical engineering, electrical engineering, manufacturing engineering, design engineering, business and even English majors who have written technical and public relations documents.

Today, many students and advising faculty are working on the project. "Everyone has learned a lot from this effort," said Barnes. "We built GoldHelox on the Brigham Young campus and then the people at Marshall helped us conduct tests that proved the telescope's optics work. In the

process, we learned a great deal that will serve us well after we graduate."

The GoldHelox project benefited from the Marshall Center's expertise in managing the development of the world's most powerful X-ray observatory — the Advanced X-ray Astrophysics Facility (AXAF). Scheduled for launch next year, AXAF will study objects ranging from comets in our solar system to quasars at the edge of the observable universe. AXAF was tested in Marshall's X-ray Calibration Facility — the same facility used by Brigham Young students to test their telescope.

"The test facility at Marshall was ideal," said Barnes. "It had an ultra-clean environment needed to assemble the telescope's sensitive optics and a huge vacuum chamber to test how well GoldHelox will function in the cold, airless void of space."

The entire team at the X-ray Calibration Facility got involved in the project. "It was a great way for the students to get actual hands-on engineering experience in a unique, world-class facility," said Jeff Kegley of Marshall's Vacuum Engineering

Test Branch. "We used our experience working with top scientists on AXAF to help the students learn how to conduct tests on space telescopes."

The tests at Marshall showed GoldHelox's optics will detect X-rays and image them on film. The GoldHelox science objective is to detect X-rays emitted during solar flares and observe other solar activities that affect Earth. Variations in solar activity influence Earth's climate and weather patterns and can damage both space- and ground-based communications and power systems.

"Being able to predict major solar eruptions would help us protect these systems," said Deric Eldredge, a Brigham Young senior majoring in electrical engineering. "GoldHelox will look for microflares which may be precursors of periods of intense solar activity, just as minor tremors on Earth happen before major earthquakes."

The project has already accomplished its main objective by enhancing the students' educational experience. "This project gives students opportunities unlike other academic experiences," said Dr. Pete Roming, a former GoldHelox project manager who now has a doctorate in physics and astronomy. "It helps prepare them for industry or graduate school and furnishes them with the skills that make them more marketable after graduation."

The students' next goal is to arrange for the automated GoldHelox to be carried aboard a Space Shuttle mission, so it can make its observations above Earth's atmosphere, which obscures solar X-rays. As the Space Shuttle orbits Earth once every 90 minutes, the Sun is in view for observations for about 20 minutes of each orbit.

The students are seeking additional funds to complete the project and fly it aboard the Shuttle. Students working on the project today are testing the telescope's tracking system — which will help aim it at particular areas on the Sun for observations; preparing paperwork to qualify the telescope to fly as a Space Shuttle payload; and signing on experts to help them interpret the solar images GoldHelox will return to Earth.



NASA photo by Terry Leibold

Congressional staffers visit Marshall

Donnie McCaghren, lead Glovebox engineer of Marshall's Systems and Analysis and Integration Laboratory, right, briefs congressional staffers during their tour last week of the Microgravity Development Laboratory. The Glovebox, managed by the Marshall Center and built by Teledyne Brown Engineering in Huntsville, provides a "mini" self-contained laboratory for performing a variety of microgravity science investigations in space. The congressional staffers, while at the Center, also visited the International Space Station mockup and the Global Hydrology and Climate Center.

Annual Christmas Dance Dec. 5 at VBC

Marshall's annual Christmas Dance will be Dec. 5 in the Von Braun Center Exhibit Hall.

Doors will open for the semi-formal event at 6 p.m. and two bands will play continuous music from 7-11 p.m. The "Little Big Band" will play the sounds of oldies and smoothies, and the "Nite Owls" will feature rock and disco music. The bands will alternate every half hour. Non-alcoholic punch and a variety of hors d'oeuvres will be served. Cash bars also will be available.

Ticket cost for NASA employees, retirees and on-site contractors is \$6 and guest tickets are \$8. Tickets will be sold until Dec. 4 and may be purchased from 11:30 a.m.-12:30 p.m. Monday-Friday at Marshall's Activity Bldg. 4752

Tree lighting and Holiday Reception planned Dec. 9

The Marshall Center's Christmas tree lighting and annual Holiday Reception will be Dec. 9. The tree lighting will be at 9 a.m. on the front lawn of Bldg. 4200, followed by the "Holiday Memories" reception from 9:30-11:30 a.m. in Bldg. 4752.

"This year's reception will ring in the holiday season with fun and socializing for everyone here at Marshall," said Leigh Key, holiday reception chairwoman. "We plan to honor the Center's charter members since this is the 40th anniversary of NASA. We also will have entertainment from several of our employees," added Key.

All Center employees, retirees and contractors are invited to participate. Shuttle services will be provided.

Talent sought

Marshall's Holiday Reception committee is seeking individuals to provide entertainment during the reception Dec. 9. Interested persons should contact Leigh Key at 544-5567 or Kim Whitson at 544-0866 by Dec. 2.

All-hands meeting is Dec. 15

An all-hands meeting will be held at 8:30 a.m. Tuesday, Dec. 15, in Morris

Microwave ovens

Continued from page 1

cooking specific items such as popcorn, use them.

- Don't use plain paper bags for cooking popcorn. Use only bags specifically designed for cooking popcorn.
- Be sure all utensils and containers are microwave compatible.
- Remove twist-ties or any other items

containing metal.

- In case of fire, immediately turn off the microwave unit and leave the door closed until the fire is extinguished. Thoroughly soak burned material in water before discarding.

More information about fire safety is available from Marshall's Industrial Safety Office in Bldg. 4203, room 6406

The Marshall Center Safety Policy

To strive to prevent injuries and occupational illnesses at and away from the workplace for our employees and support contractors, and ensure safety of our facilities and flight products. Our goal is to be number one in safety within NASA.

The Marshall Center's Goal: Establish Marshall as No. 1 in safety within NASA

- * Zero lost time mishaps
- * No OSHA reportable violations
- * No Type A property damage mishaps
- * No in-flight anomalies

The Marshall Center's Principles of Safety:

1. All mishaps can be prevented.
2. Unsafe conditions can be managed.
3. Management is directly responsible for prevention of mishaps.
4. Working safely is the responsibility of each employee and contractor.
5. A comprehensive safety and risk management program enhances the probability of mission success.
6. Management is responsible for knowing how work is actually accomplished in the workplace.
7. All employees and contractors must be trained to work safely.
8. Reporting and investigating mishaps and close calls is essential.
9. Safety off the job is an important part of safety success.

CFC

Continued from page 1

"The generous contributions given this year by each employee on the Marshall team will greatly help those who are less fortunate than ourselves.

"This year we streamlined the CFC program. Marshall is the first local agency to implement an electronic pledge card. According to the Office of Personnel Management regulations, all agencies will have to implement the electronic pledge card. It's great to be a part of the Marshall family with such hardworking and dedicated people," Nicholson said.

With 78 percent of the Marshall federal workforce participating in the campaign,

the average gift was approximately \$209.

Center offices that achieved 100 percent participation include: AA01, AB01, AI01, AI11, AI31, AL01, AM01, BC01, BF01, BF20, BF40, BF70, CC01, CE01, CO02, CO03, CO20, CO30, CO40, CO50, CO70, CR01, CR75, CR90, DA01, DD01, DE01, EB01, EB11, EB31, EE21, EE51, EH21, EJ33, EJ41, EJ43, EL22, EM41, EO46, GP01, HR10, JA01, JA02, JA10, JA21, JA41, JA51, JA52, JA63, JA81, JA91, MG01, MG10, MG20, MG30, PP01, PP04, RA30, SA01, SA24, SA34, SA45, SA52, TA01, TA11, TA21, TA31 and TA61.

Employee Ads

Miscellaneous

- ★ Three winter nursing blouses, size small, \$15 each or all for \$40. 883-9361
- ★ Square dance clothes, matching set, men's size medium, lady's size 12. 883-1686
- ★ Valhalla burial crypts, two-person in Cross Garden, value \$2,200, sell \$1,100 obo. 247-1402
- ★ Lowrey Teenie Genie electric organ with chords, stool, \$400. 883-0976
- ★ Recliner, burgandy w/black, beige and blue stripes, Stainguard-protected fabric, \$275. 828-3373
- ★ Ping pong table, \$75. 837-2223
- ★ Custom-made drapes, 91"x85", antique satin, lined, champagne w/rust and navy trim, \$125. 883-1686
- ★ 14K yellow-gold emerald and diamond ring, 18 brilliant cut diamonds, 7x3.5 mm marquise diamond, \$500. 232-5552
- ★ Ram pad sander, \$7.50; Black & Decker pad sander, \$10. 828-4564
- ★ Tokina 35-200 mm zoom lens, \$30 obo; Minolta XG-7 camera, 50 mm lens, doesn't work, \$10. 882-6446
- ★ Heavy pine double-pedestal table, 6 chairs, \$250. 586-3061
- ★ Beanie babies. 232-4658
- ★ Recliner chair, brown, \$65; three small TVs, \$25 ea.; small round table w/cloth, \$10. 722-9989
- ★ Airquipt trays for 2" x 2" slides, 18 trays at \$1 each. 837-4409
- ★ Retired beanie babies. 461-9662
- ★ King-size mattress and box springs, \$345. 880-6335
- ★ Altec Lansing speakers, 15" woofers, horns, walnut cabinets, \$275. 883-2653
- ★ Majestic fireplace insert, screen with glass doors and brass hood, adjustable blower, \$250. 883-1686
- ★ Spring horse for children, \$25. 721-9005
- ★ Maltese puppies, male, AKC, shots, health guarantee, champion bloodline, \$400 each. 753-2278
- ★ Britannica encyclopedias, \$225; Schwinn Airdyne exercise bicycle, \$250; TV/VCR cart, \$20; rocking chair, \$40. 895-9248
- ★ Christmas tree, 10', \$295. 247-5780
- ★ Little Tykes car bed, sheets, comforter, \$85; baby bed mattress, \$20. 233-0025
- ★ 1984 and 1970 Chevrolet radiators, gas tank, A/C condensor, six 14" Chevrolet rims. 837-0621

Vehicles

- ★ 1985 Toyota Camry, 153K miles, \$1,500. 467-0476
- ★ 1996 Mazda 626, 34K miles, CD player, burgundy, \$13,500. 784-9099
- ★ 1996 Red T-Bird, 52K miles, V-8, AT, 16" wheels, rear-end positraction, CD, moon roof, velour upholstery, \$12,200 obo. 232-1050
- ★ 1995 Toyota extended-cab pickup, 2-WD, 4-cyl., 5-spd., 18K miles, warranty, \$12,495. 882-0768
- ★ 1989 Firebird Formula, alloy wheels, T-tops, \$5,300. 922-0958
- ★ 1996 Pontiac Transport, 7/8 passenger, cruise, PDL/PW. 772-7842

MARSHALL STAR

Marshall Space Flight Center, Alabama 35812
(256) 544-0030

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Director of Internal Relations
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NASA at Marshall Space Flight Center may be found at the following Web site: <http://www.msfc.nasa.gov>

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- ★ 1991 Ford Ranger, 4-cyl., 5-spd., bedliner, toolbox, AM/FM cassette, \$5,495. 852-8320
- ★ 1983 GMC van, custom interior, 9K miles on new engine, \$2,000. 721-5609
- ★ 1992 Ford Explorer XLT, 4-dr., 5-spd., 139K miles, \$6,150. (931) 732-4742
- ★ 1987 Custom Dodge Ram van, V-8, less than 50K miles. 533-6648 between 2-6 p.m.

Wanted

- ★ Two motorcycles, 4-stroke dirt bikes or dual sport, one 80 or 100cc, one 250 to 650cc. 582-4390
- ★ Dogs donated for police work. 883-3637

Lost

- ★ Gold Seiko watch at Bldg. 4752 on Friday, Nov. 13. 544-3488

Found

- ★ Cream color, gray, brown, and navy striped tie w/ Texas A&M University tie tack, in north parking lot of Bldg. 4203. 544-0570

Free

- ★ Kitten to good home, first shots included, 8-week-old female, gray/white tabby. 721-7377

Center Announcements

✦ **Circus** — Ringling Bros., Barnum and Bailey will perform in Huntsville Dec. 3-6. All NASA employees, retirees and on-site contractors can receive a \$3 per-ticket discount for performances at 3:30 p.m., Saturday, Dec. 5; or 1:30 p.m. Sunday, Dec. 6. Ticket prices are \$13.50 (reg. \$16.50) or \$7.50 (reg. \$10.50) depending on seating choices. These discounted prices are only available through the NASA Exchange if a quantity of 25 tickets are purchased at one time. These seats will be assigned in blocks of 25 or more by the Von Braun Center, so early requests will receive priority. There are no further reductions for children's tickets. Ticket orders — to include name of employee, number of desired tickets and full payment — may be placed at the NASA Exchange Office in Bldg. 4752.

Contact: NASA Exchange at 544-7564.

✦ **Annual Nut Sale** — Marshall is offering Center employees, on-site contractors and retirees the opportunity to purchase a variety of nuts during the annual Nut Sale from 8 a.m.-4 p.m. daily in the Activities Bldg. 4752. Available on a first-come-first-serve basis are pecans (fancy, mammoth halves) for \$5.25 per pound; chocolate-covered pecans for \$6.75 per pound; English walnuts for \$3.25 per pound; jumbo raw peanuts for \$1.75 per pound; roasted, salted (in shell) natural pistachios for \$3.25 per pound; dry-roasted cashews at \$5.25 per pound; hickory-smoked almonds at \$3 per 12 ounces; natural, whole almonds for \$3.25 per 12 ounces; and honey-roasted almonds at \$3 per 12 ounces.

✦ **NASA Ski Week** — The Marshall Center will join other NASA centers during Ski Week 1999 from Jan. 30-Feb. 6 in Jackson Hole, Wyo. More than 250 skiers from seven NASA centers are expected at this 3,000-acre resort in western Wyoming. All Marshall employees, on-site contractors, retirees and family members are invited. **Contact:** Tom Dollman, 4-6568 or e-mail to: Tom.Dollman@msfc.nasa.gov

✦ **Closed for Thanksgiving** — The Auto Service Shop and the S&H Barber and Styling Shop will be closed Nov. 26-27 for the Thanksgiving holiday. Both shops will reopen on Monday, Nov. 30.

Contact: Auto Service Shop at 881-7640; S&H Barber and Styling Shop at 881-7932

✦ **Material Safety Data Sheets** — Material data Safety Sheets may be found at the following Web site: http://eemo.msfc.nasa.gov/environmental/haz_mat/ For more information, **contact** Marshall's Occupational Medicine and Environmental Health Services at 544-2390

✦ **NASA Alumni League** — The NASA Alumni League will sponsor a Christmas Party at 6:30 p.m. Dec. 10 at the Valley Hill Country Club in Huntsville. **Contact:** Ed Buckbee at 881-9622 or Norm Schlemmer at 881-2938.

✦ **Toastmasters** — The NASA Lunar Nooners Toastmasters Club will meet at 11:30 a.m., Tuesday, Dec. 1 in the Bldg. 4610 cafeteria conference room. All Marshall employees, contractors and friends are invited. **Contact:** Lee Johns, 544-5241

✦ **Bookfair** — The NASA Exchange-sponsored semiannual bookfair will be from 9 a.m.-3 p.m. Dec. 1-3 in Bldg. 4200, room G13. A wide selection of best-sellers, cookbooks, decorating, sports and children's books will be available for purchase. A new feature will be daily drawings at 11 a.m. and 2 p.m. to win a free book of your choice. Flyers with entry blanks are available in Marshall's Activities Bldg. 4752. For more information **contact** the Exchange Office at 544-7564.



*Happy
Thanksgiving*

Job Opportunities

CPP 99-7-CP, Configuration Management Specialist, GS-301-7, S&E, Systems Analysis & Integration Lab., Configuration Management Division, Project Support Branch. Closes Dec. 3.

CPP 99-9-RE, AST, Aerospace Flight Systems, GS-861-13, Program Development, Preliminary Design Office, Systems Engineering Division. Closes Nov. 30.

CPP 99-12-CV, Management Support Assistant (O/A), GS-303-7/8, Office of the Associate Director. Closes Nov. 30.

CPP 99-14-CV, Management Support Assistant (O/A), GS-303-7/8, Office of the Director. Closes Nov. 30.

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